

OCT 05 2007

Application No.: 10/805,218Docket No.: 200209460-2 US (1509-486)**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in the application:

**Listing of Claims:**

1. (Cancelled)
2. (Currently amended) Zoom apparatus according to claim ~~[[1]]~~9, wherein during the transition period between discrete zoom levels the optical zoom lens is arranged to be adjusted to substantially compensate for the change in discrete digital zoom level.
3. (Original) Zoom apparatus according to claim 2, wherein the optical zoom lens is arranged to be automatically adjusted to a point in the optical zoom lens zoom range that provides, as a product of zoom level with the changed digital zoom level, a total apparent zoom level substantially equal to the zoom level provided by the digital interpolation.
4. (Currently amended) Zoom apparatus according to claim ~~[[3]]~~10, wherein the zoom lens is arranged to be automatically adjusted from a first end of the zoom range of the zoom lens towards a second end of the zoom range during the transition period between discrete zoom levels.

Application No.: 10/805,218Docket No.: 200209460-2 US (1509-486)

5. (Original) Zoom apparatus according to claim 4, wherein the transition period between discrete zoom levels is arranged to be initiated only at the end points of the optical zoom lens zoom range.

6. (Currently amended) Zoom apparatus according to claim ~~[[5]]~~9, wherein the digital zoom apparatus is arranged to apply the digital interpolation such that the rate of change of total apparent zoom level is substantially equal to the rate of change of zoom level provided by the optical zoom lens.

7. (Currently amended) Zoom apparatus according to claim ~~[[6]]~~9, wherein the discrete digital zoom levels are arranged to be provided by applying discrete charge binning schemes.

8. (Cancelled)

9. (Currently amended) Zoom apparatus for digital image processing comprising:

an optical zoom lens arranged to provide an image across a continuous zoom range;

an image sensor arranged to receive an image from the optical zoom lens and to provide a digital representation of the image; and

Application No.: 10/805,218Docket No.: 200209460-2 US (1509-486)

digital zoom apparatus arranged to apply (a) one of at least two discrete zoom levels to the digital representation of the image such that the total apparent zoom level is the product of the discrete digital zoom level and the optical zoom level, and (b) digital interpolation to the digital representation of the image during a transition period between discrete zoom levels~~Zoom apparatus according to claim 1, wherein the transition period between discrete zoom levels~~ [[is]]being arranged to be initiated only at the end points of the optical zoom lens zoom range.

10. (Currently amended) Zoom apparatus for digital image processing comprising:

an optical zoom lens arranged to provide an image across a continuous zoom range;

an image sensor arranged to receive an image from the optical zoom lens and to provide a digital representation of the image; and

digital zoom apparatus arranged to apply (a) one of at least two discrete zoom levels to the digital representation of the image such that the total apparent zoom level is the product of the discrete digital zoom level and the optical zoom level, and (b) digital interpolation to the digital representation of the image during a transition period between discrete zoom levels~~Zoom apparatus according to claim 1, wherein the digital zoom apparatus~~ [[is]]being arranged to apply the digital interpolation such that the rate of change of total apparent zoom level is substantially equal to the rate of change of zoom level provided by the optical zoom lens.

Application No.: 10/805,218Docket No.: 200209460-2 US (1509-486)

11. (Currently amended) Zoom apparatus according to claim ~~[[1]]10~~, wherein the discrete digital zoom levels are arranged to be provided by applying discrete charge binning schemes.

12.-22. (Cancelled)

23. (Currently amended) A digital camera in combination with the zoom apparatus according to claim ~~[[1]]9~~.

24. (New) A digital camera in combination with the zoom apparatus according to claim 10.

25. (New) Zoom apparatus according to claim 10, wherein during the transition period between discrete zoom levels the optical zoom lens is arranged to be adjusted to substantially compensate for the change in discrete digital zoom level.

26. (New) Zoom apparatus according to claim 25, wherein the optical zoom lens is arranged to be automatically adjusted to a point in the optical zoom lens zoom range that provides, as a product of zoom level with the changed digital zoom level, a total apparent zoom level substantially equal to the zoom level provided by the digital interpolation.

27. (New) A method of operating a digital camera having (a) an optical zoom that is continuously variable between the ends of its image magnification range defined by a minimum image magnification and a maximum image magnification, (b) an

**Application No.: 10/805,218****Docket No.: 200209460-2 US (1509-486)**

electronic zoom that has discrete image magnification levels and levels between said discrete image magnification levels, and (c) a controller for total image magnification by both the optical and electronic image magnifications, the method comprising:

(1) continuously activating the controller while the optical zoom is changing toward one end of its magnification range and while (a) the optical zoom is at said one end of its magnification range, and (b) the electronic zoom is at a first of its discrete magnification levels;

(2) during step (1), multiplying the optical zoom magnification by the electronic zoom magnification of the first discrete level;

(3) in response to the optical zoom being at said one end of its range during step (1), changing the optical zoom magnification in a direction opposite to the direction the optical zoom is changing during step (1) while continuing to multiply the optical zoom magnification by the electronic zoom magnification of the first discrete level to obtain a product magnification;

(4) while the optical zoom is changing in said opposite direction during step (3), (a) changing the electronic zoom magnification in the same direction and at the same rate as the optical zoom was changed during step (1), the changes in the optical and electronic zooms of steps (3) and (4) lasting for the time taken to back off the optical zoom, and (b) adding the changing electronic zoom magnification of step (4) to the product magnification of step (3);

(5) upon completion of the back off of the optical zoom, (a) changing the electronic zoom to a second one of the discrete magnification levels that is next to the

Application No.: 10/805,218Docket No.: 200209460-2 US (1509-486)

first discrete magnification level and (b) changing the optical zoom magnification in the same direction as it was changed during step (1);

(6) during step (5), multiplying the optical zoom magnification by the electronic zoom magnification of the second discrete level; and

(7) causing the total magnification of the optical and electronic zooms from step (1) to step (5) to change without substantial step changes.

28. (New) The method of claim 27 wherein the total magnification of the optical and electronic zooms from step (1) to step (5) has a rate of change equal to the optical zoom magnification rate of change while the electronic zoom has a magnification value of 1.0.

29. (New) The method of claim 27 wherein the optical zoom magnification during step (3) does not reach either end of the optical zoom magnification range.